

Name: Answer Key

Date: \_\_\_\_\_

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### Homework: Parallelogram Proofs Part 2

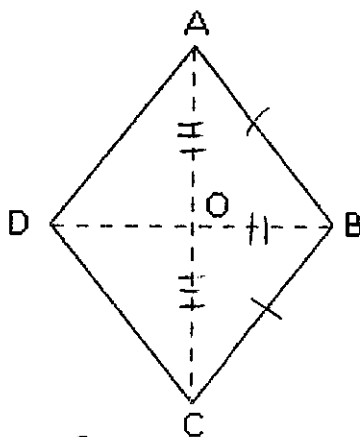
Proof of Theorem: If a parallelogram is a rhombus, then the diagonals are perpendicular.

\*You may use the following pieces of information...

1. A rhombus is a parallelogram with four congruent sides (by definition)
2. A parallelogram contains opposite sides that are parallel to each other (by definition)
3. Diagonals of a parallelogram bisect each other (we've proved this theorem so we can use it!)

Given:  $ABCD$  rhombus

Prove:  $\overline{AC} \perp \overline{BD}$



Statements	Reasons
1. $ABCD$ is a rhombus	1. Given
2. $\overline{AB} \cong \overline{CB}$	2. Def. of rhombus
3. $\overline{BO} \cong \overline{BO}$	3. Reflexive Prop.
4. $\overline{AO} \cong \overline{CO}$	4. diagonals of a rhombus bisect each other
5. $\triangle ABO \cong \triangle CBO$	5. SSS
6. $\angle AOB \cong \angle COB$	6. CPCTC
7. $m\angle AOB + m\angle COB = 180^\circ$	7. angle addition / def. of supplementary angles
8. $\angle AOB$ and $\angle COB$ are right angles	8. <u>Congruent supplementary</u> angles are right angles!
9. $\overline{AC} \perp \overline{BD}$	9. Def. of $\perp$